WHY IS THIS IMPORTANT?

Mercury (Hg) is a heavy, silver-white odorless metal which is liquid at room temperature. Mercury is found in significant amounts in thermometers, manometers, and barometers and other equipment commonly used at Iowa State University and Ames Laboratory.

The health effects of mercury exposure can be significant. Inhalation of vapors is the primary cause of toxicity due to it being readily absorbed in the lungs. Exposure to mercury vapors may cause:

- central nervous system effects (tremors)
- lung damage
- nausea, vomiting, diarrhea
- increased blood pressure or heart rate
- skin rashes and eye irritation

Mercury can combine with other elements to form toxic inorganic and organic mercury compounds that can seriously affect the nervous system, kidneys, and developing fetus.

In addition to human health effects, mercury presents a persistent threat to the environment. It has been targeted by the U.S. Environmental Protection Agency (EPA) as one of the top Persistent Bioaccumulative Toxic (PBT) chemicals to be reduced on a global level.

We need your help to work safely with mercury and protect the environment.

Here are some general recommendations for working with mercury:

Elimination & Substitution

- Substitute mercury-containing thermometers with alcohol based thermometers or electronic temperature sensors.
- Substitute mercury-filled manometers with phthalate or other suitable liquid.
- Replace mercury-filled bubblers with alternative devices such as check valves  or non-mercury bubblers (i.e. mineral oil bubblers).
- Replace mercury diffusion pumps with oil-filled pumps.

Handling & Storage

- Use enclosed systems that isolate mercury processes.
- Use secondary containers to prevent release of mercury on floors, lab benches and hoods.
- Ventilate areas where mercury or mercury compounds are used. Use chemical hoods for processes with potential to release mercury vapors.
- Contact safety personnel for mercury vapor monitoring in your laboratory.
- Contact the safety office for assistance with cleaning up mercury spills. Safety personnel use a dedicated vacuum fitted with a High Efficiency Particulate Air (HEPA) filter.

Personal Protection

- **Eye Protection:** Wear approved safety goggles or glasses with side shields.

- **Gloves:** Nitrile or neoprene work for many of these chemicals; dimethyl mercury will quickly permeate latex gloves.
- **Clothing:** Wear lab coat.
- **Ventilation:** For processes with potential to release vapor, use a hood with at least 100 fpm face velocity and work with sash at the approved height.

Disposal

- Collect mercury in metallic form when possible (metallic mercury is easily reclaimed).
- Do not use zinc or sulfur powder or commercial mercury spill kits. Contact safety personnel to assistance with spill clean up.
- Collect mercury and mercury contaminated items in a secure container or plastic bag.

Additional Information

Research activities at **Iowa State University** involving hazardous chemicals must adhere to the safety requirements defined in the ISU Chemical Hygiene Plan.

All research activities at **Ames Laboratory** require approval by the Safety Review Committee.

If you are unclear regarding any of these requirements, please contact your supervisor or an EH&S or ESH&A staff member:

ISU Environmental Health & Safety: 294-5359

Ames Laboratory Environment, Safety, Health & Assurance: 294-2153

References

Safety & Health Bulletin, "Safe Management of Mercury (Hg), DOE/EH-0697, Assistant Secretary of ES&H, U.S. Department of Energy, Washington, DC, June 2005

DISCLAIMER: This information is not intended to replace the Material Safety Data Sheet (MSDS). Always have a current, vendor-specific, hard-copy MSDS in your lab for each chemical and be familiar with the information it contains.

Handout 10200.032 – Rev 0 – 10/05

Safe Management of Mercury

Mercury can have deleterious effects on both human health and the environment.